

WASHINGTON DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
FRESHWATER MONITORING UNIT
STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 32A105
STATION NAME: Walla Walla River at Beet Road
WATER YEAR: 2011
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Introduction

Watershed Description

The Walla Walla River is a tributary of the Columbia River, joining the Columbia just above Wallula Gap in southeastern Washington. The headwaters of the Walla Walla River lie in the Blue Mountains of northeastern Oregon. The Walla Walla River supports populations of spring Chinook salmon, summer steelhead, and bull trout. Land use in the watershed is mostly dryland and irrigated agriculture.

Gage Location

The gage house is located on the left bank near the Frog Hollow and Beet Road intersection at river mile 36.5. It is located approximately a quarter mile downstream of the Gardena Farms Irrigation District #13 diversion. The period of record for this station is June 2002 to the present.

Table 1.

Drainage Area (square miles)	125(Streamstats)
Latitude (degrees, minutes, seconds)	46° 01' 25" N
Longitude (degrees, minutes, seconds)	118° 25' 33" W

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	330
Median Annual Discharge (cfs)	214
Maximum Daily Mean Discharge (cfs)	1900
Minimum Daily Mean Discharge (cfs)	17
Maximum Instantaneous Discharge (cfs)	2190
Minimum Instantaneous Discharge (cfs)	10
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	859
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	26
Number of Days Discharge is Greater Than Range of Ratings	2
Number of Days Discharge is Less Than Range of Ratings	0

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

The two days in which discharge is greater than range of ratings indicate that reported discharge was greater than two times the highest measured discharge.

A recreational swimmers' dam was erected directly downstream of the gage. This activity falsely elevated stage readings. Consequently, the reported discharge is higher than actual discharge. The data from mid-July through September are considered to be questionable estimates.

The highest flow of the year occurred on January 16th. This early season peak was caused by a very significant rain-on-snow event.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	0.60
Weighted Rating Error (% of discharge)	13.9
Total Potential Error (% of discharge)	14.5

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	131	101	15
Period of Ratings	10/1/10 to 1/19/11	1/16/11 to 6/2/11	5/17/11 to 7/4/11
Range of Ratings (cfs)	8.2 to 2850	10 to 2850	26 to 2250
No. of Defining Measurements	20	10	7
Rating Error (%)	12.5	16.8	11.5

Rating Table No.	122	701	123
Period of Ratings	7/4/11 to 8/9/11	7/21/11 to 9/28/11	8/9/11 to 9/28/11
Range of Ratings (cfs)	10 to 2850	23 to 2850	10 to 2850
No. of Defining Measurements	20	9	20
Rating Error (%)	14.3	11.8	14.3

Rating Table No.	151	132	
Period of Ratings	9/28/11 to 9/30/11	9/29/11 to 9/30/11	
Range of Ratings (cfs)	26 to 2250	8.2 to 2850	
No. of Defining Measurements	7	20	
Rating Error (%)	11.5	12.5	

Narrative

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Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	2.19
Maximum Recorded Stage (feet)	8.58
Range of Recorded Stage (feet)	6.39
Number of Un-Reported Days	2
Number of Days Qualified as Estimates	87
Number of Days Qualified as Unreliable Estimates	0

Narrative

A few small data gaps in January were filled using linear interpolation. The estimated days were flagged as questionable estimates, due to the uncertainty created by the recreational swimmers' dam. In mid-January the battery failed, this data gap was filled with data from Ecology stream gage station 32A100-Walla Walla R. at Detour Rd. [Equation: $y=(0.8598x)-2.135$, $r\text{-squared}=0.94$].

During the rain-on-snow event in January, the top half of staff gage was damaged. The lower portion, 0 to 3.34, is still solidly in place.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	Slope Conveyance
Range of Modeled Stage (feet)	Model not applied
Range of Modeled Discharge (cfs)	Model not applied
Valid Period for Model	Model not applied
Model Confidence	Model not applied

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
X-section,Longitudinal	9/29/2011

Activities Completed

Laser Level setup was installed in early March, to be used for PGI readings when staff is underwater.